

Appl. No. 10/001,267 (Docket 093/004)  
Amdt. dated February 23, 2006  
Reply to Office Action of November 23, 2005

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

What is claimed as the invention is:

41. (New) A method for producing hepatocyte lineage cells from primate pluripotent stem (pPS) cells, comprising culturing the pPS cells in a medium comprising a hepatocyte lineage differentiation agent selected from sodium butyrate, n-butyric acid, trichostatin A, propionic acid, isobutyric acid, and isoavaleic acid; wherein the hepatocyte lineage cells have at least three of the following characteristics:
  - antibody-detectable expression of  $\alpha_1$ -antitrypsin;
  - antibody-detectable expression of albumin;
  - absence of antibody-detectable expression of  $\alpha$ -fetoprotein;
  - RT-PCR detectable expression of asialoglycoprotein receptor;
  - evidence of glycogen storage;
  - evidence of cytochrome p450 activity;
  - evidence of glucose-6-phosphatase activity; or the morphological features of hepatocytes.
42. (New) The method of claim 41, wherein the hepatocyte lineage differentiation agent is sodium butyrate.
43. (New) The method of claim 41, wherein differentiation is initiated in the pPS cells before the cells are cultured with the hepatocyte lineage differentiation agent.

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44. *(New)* The method of claim 43, wherein differentiation of the pPS cells is initiated by forming embryoid bodies.
45. *(New)* The method of claim 43, wherein differentiation of the pPS cells is initiated by culturing in a medium containing dimethyl sulfoxide (DMSO), dimethylacetamide (DMA); hexmethylene bisacetamide, or another polymethylene bisacetamide.
46. *(New)* The method of claim 41, comprising further culturing the cells in a medium containing a cytokine or hormone selected from glucocorticoids, epidermal growth factor (EGF), insulin, TGF- $\alpha$ , TGF- $\beta$ , fibroblast growth factor, hepatocyte growth factor (HGF), IL-1, IL-6, IGF-I, IGF-II, and HBGF-1.
47. *(New)* The method of claim 46, wherein the cells are cultured in a medium containing at least three of said cytokines or hormones.
48. *(New)* The method of claim 47, wherein the cells are cultured in a medium containing EGF, TGF- $\alpha$ , and HGF.
49. *(New)* The method of claim 41, wherein the pPS cells are human embryonic stem cells.
50. *(New)* The method of claim 41, further comprising maintaining the hepatocyte lineage cells by culturing them in a medium containing sodium butyrate.